

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An internal planar antenna for a radio apparatus, comprising:

a ground plane including at least first and second intersecting edges with corresponding opposite edges[,];

a radiating plane including a first side and a second side longer than the first side[,];

a feed conductor for the radiating plane; latter, and

a short-circuit conductor which connects the radiating plane to the ground plane at a short-circuit point located closer to the intersection of the intersecting edges than to the corresponding opposite edges[,]; and

the ground plane including at least one non-conductive slot to improve matching of the antenna, a starting point of the slot being located in an edge one of the first and second intersecting edges of the ground plane closer to relatively near the short-circuit point than to the opposite edges and the slot traveling substantially parallel to [a] the long side of the radiating plane.

2. (Previously Presented) The antenna according to claim 1 the ground plane being a conductive layer on the upper surface of a circuit board in the radio apparatus, and the radiating plane being a conductive plane above the ground plane and having an outline shaped substantially like a rectangle, wherein said short-circuit point is located relatively close, in

proportion to the lengths of the sides of the radiating plane, to a projection of a corner of the radiating plane in the circuit board.

3. (Previously Presented) The antenna according to claim 2, wherein said slot in the ground plane increases the electrical length of the ground plane as measured from the short-circuit point.

4. (Previously Presented) The antenna according to claim 1 having at least a lower and an upper operating band, wherein the ground plane includes a first and a second non-conductive slot.

5. (Previously Presented) The antenna according to claim 4, wherein said feed conductor passes through the circuit board at a feed point, the second slot starting from the same edge of the ground plane as the first slot and traveling substantially parallel to the first slot, said feed point being located between the first and second slots on the circuit board.

6. (Previously Presented) The antenna according to claim 5, further comprising a capacitor connected across the second slot in the ground plane.

7. (Previously Presented) The antenna according to claim 1, further comprising a capacitor connected across said at least one slot in the ground plane.

8. (Previously Presented) The antenna according to claim 5, the second slot in the ground plane being arranged to resonate in the upper operating band of the antenna.

9. (Previously Presented) The antenna according to claim 1 having at least a lower and an upper operating band, said slot in the ground plane being arranged to resonate in the upper operating band of the antenna.

10. (Previously Presented) The antenna according to claim 4, the second slot starting from an edge of the ground plane which is opposite to that edge from which the first slot starts, and the first slot being arranged to resonate in the upper operating band of the antenna.

11. (Previously Presented) The antenna according to claim 4, at least one slot in the ground plane including a portion the direction of which differs substantially from the direction of said long side of the radiating plane.

12. (Currently Amended) A radio apparatus with an internal planar antenna comprising:

a ground plane on a circuit board, the ground plane including at least first and second intersecting edges with corresponding opposite edges[,];

a radiating plane including a first side and a second side longer than the first side[,];

a feed conductor for the radiating plane; latter and

a short-circuit conductor which connects the radiating plane to the ground plane at a short-circuit point located closer to the intersection of the intersecting edges than to the corresponding opposite edges[.]; and

the ground plane including at least one non-conductive slot to improve matching of the antenna, a starting point of the slot being located in ~~an edge~~ one of the first and second intersecting edges of the ground plane closer to relatively near the short-circuit point than to the opposite edges and the slot traveling substantially parallel to [a] the long side of the radiating plane.

13. (Previously Presented) An internal planar antenna for a radio apparatus having at least a lower and an upper operating band, comprising:

a ground plane;

a radiating plane;

a feed conductor for the radiating plane, wherein said feed conductor passes through the circuit board at a feed point; and

a short-circuit conductor which connects the radiating plane to the ground plane at a short-circuit point, the ground plane including a first and a second non-conductive slot to improve matching of the antenna, the second slot starting from the same edge of the ground plane as the first slot and traveling substantially parallel to the first slot, said feed point being located between the first and second slots on the circuit board.

14. (Previously Amended) The antenna according to claim 13, further comprising a capacitor connected across the second slot in the ground plane.

15. (Previously Amended) The antenna according to claim 13, the second slot in the ground plane being arranged to resonate in the upper operating band of the antenna.

16. (New) The antenna according to claim 13, the ground plane being a conductive layer on the upper surface of a circuit board in the radio apparatus, and the radiating plane being a conductive plane above the ground plane and having an outline shaped substantially like a rectangle, wherein said short-circuit point is located relatively close, in proportion to the lengths of the sides of the radiating plane, to a projection of a corner of the radiating plane in the circuit board.

17. (New) The antenna according to claim 16, wherein said slot in the ground plane increases the electrical length of the ground plane as measured from the short-circuit point.

18. (New) The antenna according to claim 13 having at least a lower and an upper operating band, wherein the ground plane includes a first and a second non-conductive slot.

19. (New) The antenna according to claim 13 having at least a lower and an upper operating band, said slot in the ground plane being arranged to resonate in the upper operating band of the antenna.

20. (New) The antenna according to claim 18, the second slot starting from an edge of the ground plane which is opposite to that edge from which the first slot starts, and the first slot being arranged to resonate in the upper operating band of the antenna.